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"Make It in America: What's Next?" Second Hearing PANEL FOUR: Innovation Today

If we want the U.S. economy to truly flourish again, then we need to focus on policies that bolster the three fundamental drivers of our economic well-being: innovation, productivity, and competitiveness. Those are the keys to job creation, wage growth, and overall quality of life in the 21st century. America once was the undisputed leader on each account, but recently it has faltered across the board. For instance, a recent ITIF report ranked the United States second-to-last among 44 countries and regions at improving its innovation capacity since 2000.[1] Meanwhile, over the past ten years, America has racked up a trade deficit of more than $4.4 trillion. Likewise, over the last ten years, America's productivity has grown at less than 40 percent of the previous decade's pace.[2] This flagging productivity growth can be tied directly to anemic wage growth, explaining why American families' median income, adjusted for inflation, did not grow at all between 1973 and 2013.[3] Put simply, American workers are suffering because America and its enterprise are falling behind in the global innovation, productivity, and competitiveness race.

Today I'd like to make four sets of policy recommendations for how Congress can tackle these challenges. They include reauthorizing the U.S. Export-Import (Ex-Im) Bank, investing in manufacturing innovation and education, spurring technology transfer and commercialization, and unlocking the economic potential of the Internet of Things.

Congress should reauthorize the U.S. Export-Import Bank without delay. The Ex-Im Bank's support is vital: In FY 2014, the Bank enabled exports from more than 33,000 U.S. exporters, supporting 164,000 U.S. jobs.[4] Yet we live in a world where export credit competition is intensifying. In 2014, China invested eight times more, and Germany five times more, in export credit than the United States did as a share of GDP.[5] What's more, the unregulated use of export credit—that is, not in accordance with OECD guidelines on countries' fair use of export credit—grows by 20 percent annually, meaning that if the United States steps away, it cedes its ability to shape global norms for the legitimate uses of export credit, to the significant long-term detriment of U.S. exporters.

Manufacturing is vital to America's economy; yet in the prior decade the United States lost more than one-third of its high-paying manufacturing jobs—a rate of loss worse than experienced during the Great Depression.[6] Effective policies and an economic rebound have restored some 800,000 of the 5.8 million lost manufacturing jobs, but more needs to be done both to ensure that America fields a world-leading manufacturing workforce and that the products and technologies of the future are invented and commercialized here.

America needs to revamp its university engineering programs so that they focus more on manufacturing engineering and produce more graduates equipped with the skills 21st-century manufacturing requires. Accordingly, Representatives Elizabeth Esty (CT-5) and Chris Collins (NY-27) (along with a bipartisan group of four Senate co-sponsors) have authored *The Manufacturing Universities Act of 2015*. The Act designates 25

universities as "Manufacturing Universities" and provides them $5 million in funding for four years to focus their engineering programs on manufacturing, to build new partnerships with manufacturing firms, to grow training opportunities, and to foster manufacturing entrepreneurship.[7]

While better engineering education will help, one of the most systemic challenges to the U.S. innovation system has been that many breakthrough scientific discoveries—such as semiconductor memory devices or flat panel LED displays—have been made in U.S. universities or corporate laboratories only to be commercialized and manufactured at scale overseas.[8] That's why the Obama Administration chartered the National Network for Manufacturing Innovation (NNMI), comprised of Institutes of Manufacturing Innovation (IMIs), as a public-private effort to restore American leadership in the development of advanced manufacturing product and process technologies, such as 3-D printing, advanced composite materials, and digital manufacturing and design innovation.[9] NNMI is simply put the most important institutional addition to America's innovation system in the past 30 years, yet even now America has only chartered 9 IMIs, compared to Germany's 70. Congress should allocate funding to make build-out of the Obama Administration's vision of a national network of 45 IMIs a reality.

But Congress can do more to spur technology transfer and commercialization initiatives that help turn new technologies into new American companies and jobs. In particular, the current federal system for funding research pays too little attention to the commercialization of technology. Congress should restore elements of the bipartisan TRANSFER Act proposed by Representative Kilmer (WA-6) to create grant opportunities for proof-of-concept research and other innovative technology transfer activities at universities, research institutes, and Federal laboratories to accelerate the commercialization of federally funded research and technologies.[10] Specifically, ITIF recommends Congress allocate 0.15 percent of agency research budgets—about $110 million per year—to fund university, federal laboratory, and state government technology commercialization and innovation efforts.[11] Congress should also consider several recommendations form the *2013 Lab-to-Market Interagency* report, which suggests creating a High-Level Office of Innovation and Federal Technology Partnerships to coordinate technology transfer and commercialization efforts and activities among federal agencies.[12]

Finally, as Congresswoman DelBene explained at your Member's hearing two weeks ago, the Internet of Things (IoT) will become an increasingly important platform for innovation. In fact, McKinsey last month estimated that the Internet of Things will have an economic impact of at least $3.9 trillion and as much as $11.1 trillion a year by 2025.[13] By 2020, some 40 billion objects will have embedded sensors connected to the Internet. As such, it is critically important that America gets IoT policy right, as ITIF writes in *10 Policy Principles for Unlocking the Internet of Things*.[14] First, Congress should charge key federal agencies with developing innovation strategies that include a strategic roadmap guiding the deployment and adoption of IoT technologies in the parts of the economy for which they are responsible—e.g., transportation for DoT and homes and buildings for HUD. Second, government should become an early adopter of the Internet of Things to demonstrate the benefits of the technology. Government agencies should make "smart" the default for all new investments and allocate funding for smart city demonstration projects. Here, forging public-private partnerships can help overcome the initial costs of funding IoT deployment projects. For example, a city may not have the budget to install smart streetlamps, even if they would end up paying for themselves in energy savings. Innovative partnerships whereby the private sector pays for, builds, and manages certain technology projects while receiving a portion of the savings can facilitate greater penetration of IoT projects. And as

government agencies at the municipal, state, and federal levels integrate connected devices into public infrastructure and government services, the de-identified data they collect should be treated as a public resource and shared with the public accordingly.

Restoring America's world-leading position in innovation, productivity growth, and competitiveness is an attainable goal—but only if we implement smart public policies that unlock the innovative power and productivity growth potential of the public and private sectors alike.

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